

\$ AT  
JFW

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No. : 10/087,933 Confirmation No. : 5283  
First Named Inventor : HOLGER JAHN  
Filed : MARCH 5, 2002  
TC/A.U. : 3611  
Examiner : PAUL ROYAL.  
  
Docket No. : 1891.50917US  
Customer No. : 23911  
Title : **WHEELCHAIR TIRE**

**APPEAL BRIEF**

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

On September 13, 2005, the Appellant appealed to the Board of Patent Appeals from the final rejection of pending Claims 7-23. The following is Appellants' Appeal Brief submitted pursuant to 37 C.F.R. §41.37.

Please charge the appeal brief fee of \$500 to Deposit Account No. 05-1323 (Docket No. 037226.50917US). The Director is authorized to credit any overpayments or charge any deficiencies to said deposit account.

**Real Party In Interest**

This application is assigned to Ralf Bohle GmbH & Co. KG, Reichshof, Germany, which is the real party in interest in this appeal.

**Related Appeals and Interferences**

Applicant and counsel are not aware of any related appeals or interferences which would affect, be affected by, or have a bearing on this appeal.

11/15/2005 MBIZONES 00000122 051323 10087933  
01 FC:1401 -500.00 DA

11/15/2005 MBIZONES 00000132 051323 10087933  
- 1 - 01 FC:1402 500.00 DA

MBIZONES 11/15/2005 MBIZONES  
11/15/2005 MBIZONES 00000122 051323 10087933  
01 FC:1401 -500.00 CR

### **Status of Claims**

Claims 7-23 are pending and under examination. Claims 7-8 and 11-23 stand rejected in a fourth Office Action, which is the second final rejection. Claims 9-10 stand objected to as depending from rejected claim 8, but would be allowable if placed in independent form. Because the claims have been rejected at least twice, this appeal is proper under 37 C.F.R. §41.31. Claims 7-23 form the subject of this appeal.

### **Status of Amendments**

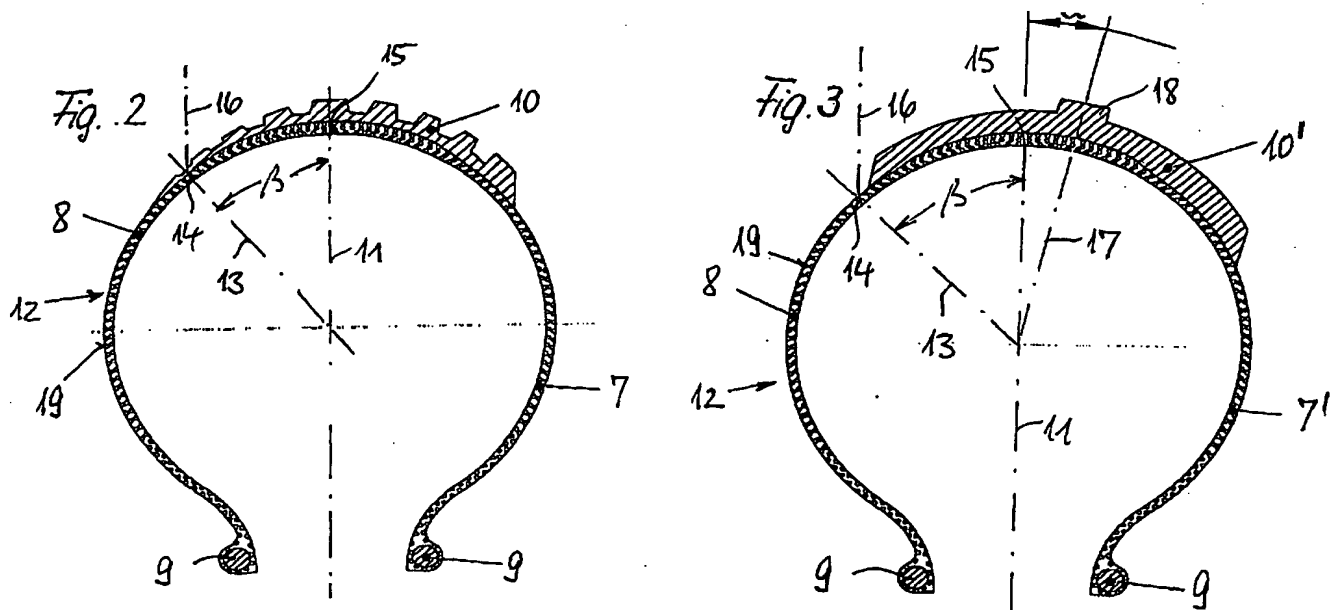
There are no unentered amendments.

### **Summary of Claimed Subject Matter**

Independent claim 7 is directed to unique wheelchair tire with a tire carcass (8) provided with a running profile (10) which extends annularly around the carcass (8), and is displaced asymmetrically with respect to a tire carcass center plane (11), as shown in detail in Figs. 2-3, which are reproduced for the Board's convenience on the next page. Portions of at least one of the running profile (10) and the carcass (8) are smooth are on the laterally outward side of the tire when in an in use position, in order to limit chafing of the wheelchair occupant's hands. Claims 11-12 depend from, or incorporate the limitations of, claim 7.

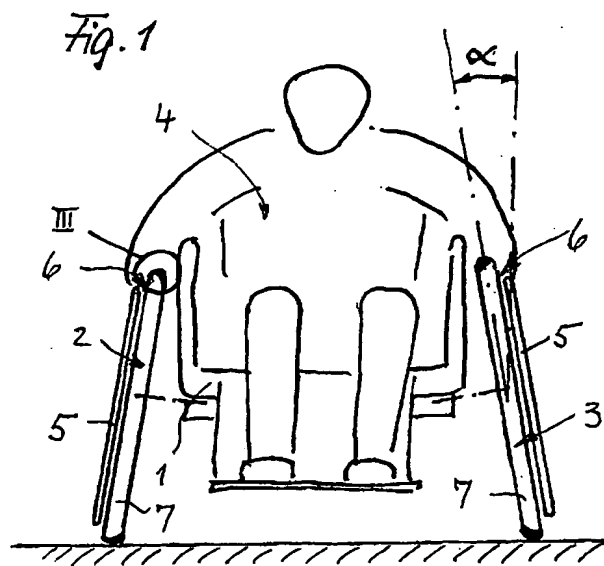
Independent claim 8 recites the wheelchair tire as in claim 7, with the asymmetrically-*disposed* profile (10') being further recited as symmetrically-*shaped*, as shown in Fig. 3. Claims 9-10 and 13 depend from claim 8.

Finally, claims 22 and 23 recite a wheelchair tire and wheel chair assembly, respectively, wherein the tire profile of claim 7 is arranged such that running profile's center is aligned with the tire's the ground contact area.



- 3 -

The present invention, as recited in the independent claims, is directed to a unique asymmetrical tire profile which maintains a tread profile at the tire's ground contact point (to provide necessary traction and wear characteristics), while at the same time presenting the wheelchair occupant's hands with a smooth surface at the outside top of the tire to prevent abrasion. Fig. 1, reproduced below, illustrates this overall arrangement:



In the enclosed Declaration of the inventor Mr. Holgen Jahn (the Technical Director of the real party in interest, Ralf Bohle GmbH), Mr. Jahn states that a problem with conventional wheelchair tires is that the hands, especially the balls of the thumbs of the wheelchair occupant, contact the running profile or tire tread of conventional wheelchair tires. When pushing a wheelchair, the occupant's hand grabs the driving ring and at the same time touches the wheelchair tire at least with the ball of the thumb. It is, therefore, quite common among wheelchair drivers to wear gloves, which at least cover the palm of the hands. Chafing of the balls of the thumb of a wheelchair driver also

can occur when the occupant brakes the wheelchair by a sliding engagement between his hands and the driving ring, as the balls of the occupant's thumbs also slide along the side of the wheelchair tire. Holgen Jahn Dec. at ¶4.

The wheelchair tire according to the present invention substantially reduces the risk of chafing of the balls of the thumbs of a wheelchair occupant by asymmetrically arranging the running profile of the tire. The running profile itself can be configured symmetrically or asymmetrically. Further, portions on the outside of the tire, said portions also extending annularly around the carcass, are configured to be smooth so that the balls of the occupant's thumbs can slide along these portions without the risk of chafing or injuries. The word "smooth" means that the exterior wall of the tire has no grooves, partial mould seam or knobs which result from the arrangement of vent openings during the tire production. By asymmetrically arranging the running profile and by configuring portions of at least one of the running profile and the carcass on the laterally outward side of the tire when in an in-use position to be smooth, chafing of a occupant's hands is limited and injuries are prevented when a wheelchair occupant manually rotates and/or brakes a wheel. *Id.* at ¶5.

As further noted in the enclosed declaration of Mr. Errol Marklein, a wheelchair user and Vice President of Advanced Product Development of a company which produces and sells wheelchairs (Sunrise Medical GmbH), this new wheelchair profile arrangement has proven to be most effective in preventing injuries, as it is useful to wheelchair occupants using various

different techniques for propelling their wheelchairs, and in particular those users with tertaplegia (*i.e.*, with no finger function). Errol Marklein Dec. at ¶ 3.

### **Ground of Rejection to Be Reviewed on Appeal**

Independent claims 7, 14, 22 and 23, and their dependent claims 11, 15, 18-19 and 21 stand rejected under 35 U.S.C. § 103(a) as obvious in view of U.S. Patent 4,351,540 to Minnebraker (“Minnebraker”), in view of U.S. Patent 6,142,201 to Harms (“Harms”). Claim 17 is not specifically identified as rejected, however, this claim depends from claim 15.

Independent claims 8 and 16 claims 11, 15, 19-19 and 21 stand rejected under 35 U.S.C. § 103(a) as obvious in view of Minnebraker and Harms, in further view of U.S. Patent 3,656,532 to Roberts (“Roberts”).

Finally, claims 12-13 and 20 stand rejected under 35 U.S.C. § 103(a) as obvious in view of Minnebraker and Harms, in further view of U.S. Patent 3,930,527 to French (“French”).

Claims 7-23 stand together as patentable over the combination of Minnebraker and Harms.

### **Argument**

In the Final Office Action mailed May 13, 2005, the Examiner maintained the prior rejection of the independent claims as obvious in view of the Minnebraker and Harms references.

In essence, the Examiner identified a conventional wheelchair (Minnebraker), and then merely asserted that it would have been obvious to

have adapted a sand buggy tire profile (Harms) to a wheelchair tire to solve the hand chaffing problem in the manner of the pending claim 7.

The Examiner similarly asserts with virtually no justification that it would have been obvious to apply an automotive tire tread profile (Roberts) to Harms' sand buggy tire profile to obtain claim 8's asymmetrically-disposed, symmetrically-shaped tread profile.

The Appellant respectfully submits that the pending rejections are classic examples of improper use of hindsight, in which similar-*appearing* features in a variety of references are "cherry-picked" to post-hoc reconstruct the present invention, without any consideration of whether one of skill, without knowledge of the present invention, would have found the necessary teachings or suggestions for the combination – even where (as in this case) the asserted combinations would not result in the invention.

*The Claims Are Patentable Over Minnebraker and Harms.*

Minnebraker is cited as teaching a wheelchair with canted wheels. May 13, 2005 Office Action at 3-4. The Examiner acknowledges that this reference fails to teach or suggest the recited asymmetrically-disposed running profile. *Id.* at 4.

The Harms reference is cited as teaching a tire "which is asymmetrically disposed with respect to the tire carcass center plane." July 23, 2004 at 5. The Appellant submits that one of ordinary skill in the art would not have considered combining Minnebraker and Harms.

Harms teaches a tire for a "sand car" or "dune buggy" which is equipped

with a shoulder or ridge (“radial face surface 30”) on the *outside* of the tire, which provides a vertical surface for exerting steering forces in deep sand; the profile faces outboard to push sand plumes away from the vehicle. Harms at 2:12-17.

Harms Would Not Have Been Considered. As a threshold matter, one of ordinary skill would never have looked to a sand buggy vehicle application for solutions for a wheelchair tire application.

As explained by Mr. Jahn, conventional wheelchair tires are comparable to bicycle tires in carcass and running profile design. Wheelchair tires have to be lightweight tires since the wheelchair has to be pushed by hand and possibly has to be lifted up, and they must sustain air pressure levels comparable to bicycle tires. With respect to the design of the running profile, a wheelchair tire running profile has to provide traction on surfaces where the wheelchair is to be pushed by hand, *i.e.*, it should not slip on the ground in order to move a wheelchair forward. This is typically obtained with rubber compounds comparable to those used in bicycle tires (as opposed to motor vehicle tire compounds). Inasmuch as wheelchair tires and bicycle tires are very closely related, therefore, wheelchair tires are manufactured and designed by manufacturers of bicycle tires. Jahn Dec. at ¶3.

Harms relates to a tire for a motor-driven vehicle, and in particular a tire with a single outward-facing annular lug or wall 28. As Messrs. Jahn and Marklein confirm, tires for sand cars are totally different with respect to design when compared to wheelchair tires or bicycle tires. When designing tires for motor-driven vehicles such as a sand car, durability and mileage are important



concerns, whereas the weight of the tire is not so critical (unlike the case with wheelchair or bicycle tires). Further, the Harms sand car tire is designed to only provide steering (*i.e.*, generate force in a lateral direction), and thus it has no tread design which provides traction in the circumferential direction, a profile feature a wheelchair must have, and thus further fails to suggest any applicability to wheelchair tire design. Moreover, tires for motor-driven vehicles are by no means suitable for wheelchair use since, in addition to being too heavy in construction, their performance objectives encompass characteristics which are incompatible with wheelchair use, such as high rolling resistance (a low rolling resistance be is very important for a wheelchair tire). Wheelchair tires are also inflated to very high interior pressure (up to on the order of 10 bar) to keep the rolling resistance low. Such high interior pressures would cause severe damage to tires for motor-driven vehicles. Jahn Dec. at ¶¶8-9; Marklein Dec. at ¶6.

For the foregoing reasons, as supported by the enclosed declarations of men skilled in the art with many years of experience in the field, the Appellant respectfully submits that as a first matter, one skilled in the art *not possessing hindsight knowledge of the present invention* would not have considered the Harms reference or attempting to combine the disparate features with Minnebraker to obtain any wheelchair tire, let alone the present hand-protective wheelchair tire. *Accord* Jahn Dec. at ¶13; Marklein Dec. at ¶7 (Harms would not have even been considered, let alone for combination with Minnebraker).

There Is No Suggestion For The Asserted Combination. The application of the Harm's sand buggy tire profile to a wheelchair tire would be highly undesirable, and thus would not one of ordinary skill have perceived any suggestion for its combination with Minnebraker.

If, for some inexplicable reason, one of ordinary skill *were* to consider the Harms reference, he or she would have recognized that Harms' teachings are fundamentally incompatible with the needs of a wheelchair tire designer seeking to protect a wheelchair user's hands from injury.

As Mr. Jahn sets forth in his declaration, even if a tire similar Harms' were to be considered for use on a wheelchair, such a tire would be highly undesirable and would not lead to the inventive wheelchair tire. As noted above, the vertical wall (surface 30) on the annular lug 28 of the Harms tire is always mounted so as to be directed outwardly of the vehicle. A Harms profile on a wheelchair tire would result in the running profile and/or carcass being disposed laterally *outward*, *i.e.*, if there were any hand-friendly smooth surface on such a tire, it would be located exactly the opposite of the present invention – inward, where it would be of little or no use to the wheelchair occupant. Jahn Dec. at ¶8. Indeed, the occupant would be presented an outward-facing ridge which would be uncomfortable to reach over in order to grasp the tire for propulsion, while potentially preventing a firm grasp on the tire when braking the wheelchair. In fact, due to the concentration of friction contact on the occupant's palm at the tip of the outward-facing ridge, during braking the Harm's ridge could potentially be a source of friction burns to the occupant's palm during braking. *Id.* at ¶10-12.

Notwithstanding Harms' need to locate its annular lug to be directed outward of the vehicle in order to properly function, if the annular lug 28 and the surface 30 of the Harms tire were arranged against the teaching of this reference so as to face inwardly towards the vehicle (even though such would alter a principle of operation of the Harms sand buggy tire), a wheelchair occupant's hand would be presented at the top of the tire with an uncomfortable ledge *cutting directly into* their palm. Further, such a tire would also be undesirable since it would rest on the ground on only a narrow strip at the tip of the annular lug 28, and thereby provide unsatisfactory performance, *e.g.*, poor steering, braking, rolling resistance and tire wear performance. Jahn Dec. at ¶10-12.

Thus, even if one of ordinary skill were aware of Harms, they would have immediately dismissed this reference from further consideration as unsuitable for a wheelchair tire application.<sup>1</sup> Jahn Dec. at ¶13; Marklein Dec. at ¶7.

---

<sup>1</sup> As a separate matter, claims 8 and 16 recite an asymmetrically-disposed, symmetric running profile, a feature recited in the originally filed claims. In response to the Appellant having highlighted this feature the most recent response, the Examiner for the first time asserted that the Roberts *car* tire suggests this feature. The Appellant respectfully submits this citation is representative of the hindsight nature of the Examiner's analyses, as rather than searching for a reference which truly would have made claims 8 and 16 obvious by teaching or suggesting the feature at issue, it appears that the Examiner has merely scrambled to find something that "looks sort of like it." Roberts teaches a conventional car tire tread (*i.e.*, flat across the outer circumference), which has asymmetric *side walls*. Roberts Fig. 1. In fact, contrary to the assertion that Roberts teaches a profile "laterally offset with respect to the tire center plane by a *predetermined offset angle*" (*i.e.*, parroting the present claim language), Roberts at most shows that the center of its straight, flat tread center is *laterally* displaced from the tire center – *not* rotated asymmetrically through a *predetermined angle* as recited in the claims and show in present Fig. 3. In fact, rather than teaching any displacement of a tread profile through an angle as in the present invention, Roberts in fact only teaches *extending* the tread out in one lateral direction to meet an altered (extended) sidewall.

For the foregoing reasons, the Appellant respectfully submits that there is in the absence of any teaching or suggestion to combine the incompatible Harms sand buggy tire profile with Minnebraker, only hindsight impermissibly motivates the Examiner's assertion that it would have been obvious to combine these references. Accordingly, the pending claims are patentable over these references under § 103(a).

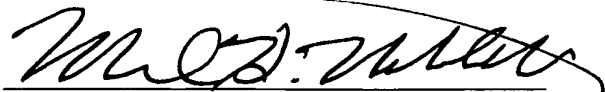
### **Conclusion**

For the foregoing reasons, the Applicants respectfully submit that the rejection of Claims 7-23 as obvious over Minnebraker and Harms under § 103(a) is in error. The Board is respectfully requested to reverse the rejection and order allowance of claims 7-23.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #037226.50917US).

November 14, 2005

Respectfully submitted,



Donald D. Evenson  
Registration No. 26,160  
Mark H. Neblett  
Registration No. 42,028

CROWELL & MORING LLP  
Intellectual Property Group  
P.O. Box 14300  
Washington, DC 20044-4300  
Telephone No.: (202) 624-2500  
Facsimile No.: (202) 628-8844

**Claims Appendix**

The claims on appeal read as follows:

1. (withdrawn) Wheel chair tire having a carcass (8) with a running profile (10, 10') applied to its exterior side and optionally having a raised lettering,

wherein, at least on an exterior tire wall, starting from a region adjoining later with a rim edge, to at least a first boundary plane (13) extending through a center of a tire cavity, the carcass (8) is constructed to be smooth and free of profiles and lettering, an intersection point (14) of the first boundary plane (13) on the tire extending maximally offset by an angle ( $\beta$ ) of  $45^\circ$  with respect to an intersection point (15) of a center plane (11) with the tire (7).

2. (withdrawn) Wheelchair tire according to Claim 1,  
wherein the running profile (10) is constructed asymmetrically with respect to the center plane (11).

3. (withdrawn) Wheelchair tire according to Claim 1,  
wherein the running profile (10') is arranged laterally offset with respect to the center plane (11).

4. (withdrawn) Wheelchair tire according to Claim 3,  
wherein the angle ( $\theta$ ) of the offset of the center plane (17) of the profile (10') corresponds to the camber of the wheel arrangement.

5. (withdrawn) Wheelchair tire according to Claim 1,  
wherein the profile elevations of the running profile (10, 10') are bounded toward the smooth exterior wall of the carcass (8) by a second boundary plane (16) which extends parallel to the center plane (11) and through the intersection point (14) of the first boundary plane (13) with the tire (7).

6. (withdrawn) Wheelchair tire according to Claim 1,  
wherein an exterior tire wall is provided with a low-friction, optionally also slidable coating (19).

7. (previously presented) Wheelchair tire comprising:  
a tire carcass, and  
a running profile extending annularly around the carcass,  
wherein the running profile is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon.

8. (previously presented) Wheelchair tire comprising:  
a tire carcass, and  
a running profile extending annularly around the carcass,

wherein the running profile is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon,

wherein the running profile is symmetrically configured and arranged laterally offset with respect to the center plane by a predetermined offset angle.

9. (original) Wheelchair tire according to claim 8, wherein the predetermined offset angle corresponds to a wheel camber of a wheelchair wheel.

10. (original) Wheelchair tire according to claim 9, wherein said offset angle is between 9° and 16°.

11. (original) Wheelchair tire according to claim 7, wherein the running profile is asymmetrically configured with respect to the tire carcass center plane.

12. (previously presented) Wheelchair tire comprising:

a tire carcass,

a running profile extending annularly around the carcass, wherein the running profile is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be

smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon, and

a low friction coating on the portions configured to be smooth.

13. (original) Wheelchair tire according to claim 8, comprising a low friction coating on the portions configured to be smooth.

14. (previously presented) Wheelchair assembly comprising:

a wheelchair seat for a wheelchair occupant, and a pair of wheels disposed at lateral sides of the seat and being manually rotatable by the wheel chair occupant,

wherein each wheel includes a rim surrounded by a tire, each tire having a tire carcass surrounded by a running profile, and

wherein the running profile of each of the tires is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon.

15. (original) Wheelchair assembly according to claim 14, wherein said wheels are mounted with a predetermined camber of between 9° and 16°.



16. (previously presented) Wheelchair assembly comprising:

a wheelchair seat for a wheelchair occupant, and a pair of wheels disposed at lateral sides of the seat and being manually rotatable by the wheel chair occupant,

wherein each wheel includes a rim surrounded by a tire, each tire having a tire carcass surrounded by a running profile,

wherein the running profile of each of the tires is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon, and

wherein the running profile of each tire is symmetrically configured and arranged laterally offset with respect to the tire center plane by a predetermined offset angle.

17. (original) Wheelchair assembly according to claim 15, wherein the running profile of each tire is symmetrically configured and arranged laterally offset with respect to the tire center plane by a predetermined offset angle; said predetermined offset angle corresponding to a predetermined camber of the respective wheel.

18. (original) Wheelchair assembly according to claim 14, wherein the running profile of each tire is asymmetrically configured with respect to the associated tire carcass center plane.

19. (original) Wheelchair assembly according to claim 15, wherein the running profile of each tire is asymmetrically configured with respect to the associate tire carcass center plane.

20. (previously presented) Wheelchair assembly comprising:

a wheelchair seat for a wheelchair occupant, and a pair of wheels disposed at lateral sides of the seat and being manually rotatable by the wheel chair occupant,

wherein each wheel includes a rim surrounded by a tire, each tire having a tire carcass surrounded by a running profile,

wherein the running profile of each of the tires is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon, and

wherein each tire is provided with a low friction coating on the portions configured to be smooth.

21. (original) Wheelchair assembly according to claim 14, wherein each wheel includes a driving ring manually engageable by the wheelchair occupant to drive the wheel.

22. (previously presented) Wheelchair tire comprising:

a tire carcass, and

a running profile extending annularly around the carcass,

wherein the running profile is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon, and a center of a ground contact area of the tire is substantially aligned with a center of the asymmetric running profile.

23. (previously presented) Wheelchair assembly comprising:

a wheelchair seat for a wheelchair occupant, and a pair of wheels disposed at lateral sides of the seat and being manually rotatable by the wheel chair occupant,

wherein each wheel includes a rim surrounded by a tire, each tire having a tire carcass surrounded by a running profile, and

wherein the running profile of each of the tires is asymmetrically disposed with respect to a tire carcass center plane with portions of at least one of the

running profile and carcass disposed laterally outward of a wheel chair in an in use position being configured to be smooth so as to limit chafing of a wheel chair occupant's hands when manually rotating a wheel with said tire mounted thereon, and a center of a ground contact area of the tire is substantially aligned with a center of the asymmetric running profile.

**Evidence Appendix**

Enclosed herewith are the following:

1. Declaration of Holger Jahn.
2. Declaration of Errol Marklein



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/087,933 Confirmation No. : 5283  
First Named Inventor : HOLGER JAHN  
Filed : MARCH 5, 2002  
TC/A.U. : 3611  
Examiner : PAUL ROYAL  
Docket No. : 1891.50917US  
Customer No. : 23911  
Title : **WHEELCHAIR TIRE**

**DECLARATION UNDER 37 CFR §1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Mr. Holger Jahn, declare that:

1. I am a resident and citizen of Germany. I am the inventor of the invention described in the above-referenced application.

2. I have an 18 years experience in the field. My current job title at Ralf Bohle GmbH & Co. KG is Technical Director.

3. The present invention relates to wheelchair tires. Conventional wheelchair tires are comparable to bicycle tires with respect to the design of their carcass and with respect to the design of the running profile or tire tread. With respect to carcass design, wheelchair tires have to be lightweight tires since the wheelchair has to be pushed by hand and possibly has to be lifted up. Further, air pressure of wheelchair tires and bicycle tires is comparable. With respect to the design of the running profile, wheelchair tires have to have a running profile

which provides some traction since the wheels of a wheelchair are pushed by hand and should not slip on the ground in order to move a wheelchair forward. Further, bicycle tires and wheelchair tires are comparable in the rubber compounds used. A minor difference between wheelchair tires and bicycle tires with respect to the rubber compound used is that wheelchair tires are often made of a gray-colored rubber compound, which does not leave any marks on the floor, which is usually not the case when using black bicycle tires. Inasmuch as wheelchair tires and bicycle tires are very closely related and, therefore, wheelchair tires are manufactured and designed by manufacturers of bicycle tires.

4. One problem with conventional wheelchair tires is that the hands, especially the balls of the thumbs of a wheelchair driver, contact the running profile or tire tread of conventional wheelchair tires. When pushing a wheelchair, the hand of a wheelchair driver grabs the driving ring and at the same time touches the wheelchair tire at least with the ball of the thumb. It is, therefore, quite common among wheelchair drivers to wear gloves, which at least cover the palm of the hands. Chafing of the balls of the thumb of a wheelchair driver can occur when the wheelchair driver brakes his wheelchair by a sliding engagement between his hands and the driving ring. During such a sliding engagement the balls of the thumbs of the wheelchair drivers also slide along the side of the wheelchair tire.

5. The wheelchair tire according to the present invention now reduces the risk of chafing of the balls of the thumbs of a wheelchair driver. This is achieved by asymmetrically arranging the running profile of the tire, said running profile

extending annularly around the carcass. The running profile itself can be configured symmetrically or asymmetrically. Further, portions on the outside of the tire, said portions also extending annularly around the carcass, are configured to be smooth so that the balls of the thumbs of a wheelchair driver can slide along these portions without the risk of chafing or injuries. The word "smooth" means that the exterior wall of the tire has no dynamo grooves, no partial mould seam and also no knobs which result from the arrangement of vent openings during the tire production. By asymmetrically arranging the running profile and by configuring portions of at least one of the running profile and the carcass disposed laterally outward of a wheelchair in an in-use position to be smooth, chafing of a wheelchair occupant's hands is limited and injuries are prevented when a wheelchair occupant manually rotates a wheel with the inventive wheelchair tire mounted thereon.

6. The Office Action mailed May 13, 2005 cites U.S. Patent No. 4,351,540 to Minnebraker and U.S. Patent No. 6,142,201 to Harms as prior art references.

7. The Minnebraker reference describes a wheelchair having a conventional wheelchair tire. It can easily be seen in figure 2 of Minnebraker that the balls of the thumbs of a wheelchair occupant would touch the tire exterior disposed laterally outward of the wheelchair when manually rotating the wheelchair wheel.

8. The Harms reference shows a tire for a sand car which is intended for use as a front tire, i.e. simply for steering not for moving the sand car forward. The Harms-tire has an annular lug 28, said annular lug facing outward and hav-



ing an outward surface 30. It is clearly said in Harms, column 3, lines 42 to line 44 that "the tire is always mounted with the surface 30 directed outwardly of the vehicle." Opposite to the outward surface 30, the Harms tire has a surface 32 carrying no running profile which is, as a consequence, always directed inwardly of the vehicle. By directing the surface 30 outwardly and the smooth surface 32 inwardly, sand raised by the outer portion of the tire will be expelled laterally from the vehicle rather than into the side of the car. *See* Harms, column 3, lines 42 to 46.

9. Harms clearly relates to a tire for a motor-driven vehicle, namely a so-called sand car. Tires for sand cars are totally different with respect to the carcass design when compared to wheelchair tires or bicycle tires. When designing tires for motor-driven vehicles, durability and mileage is an important concern, whereas the weight of the tire is not so critical. Further, the Harms-tire is a tire intended for use as a front tire on a sand car and, therefore, has to provide no traction in circumferential direction but only in a sideways direction. Because tires for motor-driven vehicles are in so many respects different from wheelchair tires and bicycle tires, a skilled man in the art would not consider the Harms reference when trying to improve a conventional wheelchair tire.

10. But even if a tire of similar construction to the Harms tire were to be considered for use on a wheelchair, such a tire would be highly undesirable and would especially not lead to the inventive wheelchair tire. It has already been said that the surface 30 on the annular lug 28 of the Harms tire is always mounted so as to be directed outwardly of the vehicle. As a consequence, the

Harms tire cannot suggest to configure portions of at least one of the running profile and the carcass disposed laterally outward of a wheelchair in an in-use position to be smooth. Rather, the Harms reference teaches the exact opposite, namely, to arrange a smooth surface 32 laterally inward of a vehicle.

11. Notwithstanding Harms' need to locate its annular lug to be directed outwardly of the vehicle, even if the annular lug 28 and the surface 30 of the Harms tire would really be arranged against the teaching of this reference so as to face inwardly towards the vehicle, a wheelchair occupant's hand would be presented at the top of the tire with an uncomfortable ledge cutting into their palm. Further, such a tire would also be undesirable since it would rest on the ground on only a narrow strip at the tip of the annular lug 28.

12. If, on the other hand, the Harms tire would be mounted with the annular lug 28 and the surface 30 facing outward from a wheelchair, thereby following the teachings of the Harms reference, the occupant would be presented an outwardly facing ridge, namely the annular lug 28, which would be uncomfortable to reach over in order to grasp the driving ring for propulsion. Even more, when attempting to brake the wheelchair, said outward facing ridge would potentially prevent the occupant from obtaining a firm grasp on the driving ring and the tire and it could potentially be a source of friction burns to the occupant's palm during braking.

13. As a consequence, a designer of wheelchair tires would by no means have considered the Harms reference. Moreover, even if he knew about the existence of this reference, he would not have sought to combine it with the Minne-

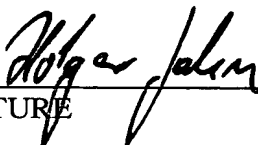
braker reference, because such combination would not lead to the inventive user-hand-protecting wheelchair tire.

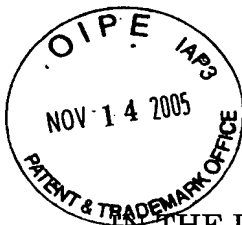
14. My invention is the first wheelchair tire having an asymmetrically disposed running profile and a smooth annular portion, providing the desired improved functionality as described in my patent application. I believe it is only with the benefit of hindsight knowledge of my invention that the suggestion to combine Harm's sand car tire arises as, for the reasons presented above, one of skill in the art presented with only the Minnebraker and Harms references would not have had any reason to try to combine the references, as no application of the Harms sand car tire profile to a wheelchair will result in my hand-protecting wheelchair tire design.

I declare that the preceding statements which are made from my own knowledge are true and that the preceding statements which are made on information and belief are believed to be true.

I am aware that willful false statements and the like are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and may jeopardize the validity of the application or any patent issuing thereon.

2005, Nov. 2nd  
DATE

  
SIGNATURE



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. : 10/087,933 Confirmation No. : 5283  
First Named Inventor : HOLGER JAHN  
Filed : MARCH 5, 2002  
TC/A.U. : 3611  
Examiner : PAUL ROYAL  
Docket No. : 1891.50917US  
Customer No. : 23911  
Title : **WHEELCHAIR TIRE**

**DECLARATION UNDER 37 CFR §1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Errol Marklein, declare that:

1. I am a resident and citizen of Germany.
2. I am Vice President Advanced Product Development of the Company Sunrise Medical GmbH & Co Kg, which produces and sells wheelchairs. I am myself dependent on wheelchair use for the past 30 years, and, as a consequence, daily use wheelchairs.
3. It is my experience that the inventive wheelchair tires that are the subject of the above-referenced patent application are very helpful for wheelchair occupants, since they can effectively prevent injuries of the palms of the hands when the occupants are driving their wheelchairs. This fact is extremely important.

Fact is that wheelchairs users have different techniques of propelling the wheelchairs.

All of them need good friction between the hand/palm and the wheelchair pushrim/wheelchair tire. due to limited space (the overall width of the wheelchair is in most cases a limiting factor for mobility) the users tend to mount the pushrim as close as possible to the wheelchair rim/tire. with this "set up" they achieve 2 functions.

1. minimize overall width

2. ability to use the Wheelchair tire for additional friction (contact between tire and palm).

The additional friction allows users with Tetraplegy (no finger function) to propel the wheelchair themselves.

4. Traditionally, bicycle tires were used on wheelchairs. For indoor use, special non-marking rubber compounds of usually gray color are used for wheelchair tires. It is important that a wheelchair tire is a lightweight tire since pushing a wheelchair is harder if more weight has to be moved around. Further, wheelchair tires need a running profile which provides a good traction. It is very hard and almost impossible to move a wheelchair forward when the wheelchair tire slips on the ground when turning the wheelchair wheel.

In the mentioned patent the specific parameters for Wheelchair tires are balanced to the specific needs of users that are selfpropelling in a save and economic manner.

5. I am aware that the Office Action mailed May 13, 2005 cites U.S. Patent No. 4,351,540 to Minnebraker and U.S. Patent No. 6,142,201 to Harms as prior art references.

6. The Harms reference relates to a sand car tire intended for use as a front tire. Tires for motor-driven vehicles are by no means suitable for wheelchair use since they are too heavy in construction and are designed to perform totally different compared to a wheelchair tire, e.g., rolling resistance is of little concern with respect to a tire for a motor-driven sand car, whereas a low rolling resistance is very important for a wheelchair tire. Further, wheelchair tires are driven with very high interior pressure up to 10 bar to keep the rolling resistance low. Such high interior pressures would cause severe damage to tires for motor-driven vehicles.

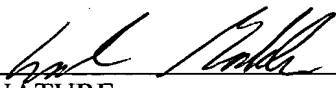
7. As a consequence of the differing applications, there are so many differences between tires for motor-driven vehicles and wheelchair tires that a designer of wheelchair tires would not even consider the design of tires for motor-driven vehicles when trying to improve a wheelchair tire. In particular, a designer would especially not consider the Harms reference.

Application No. 10/087,933

I declare that the preceding statements which are made from my own knowledge are true and that the preceding statements which are made on information and belief are believed to be true.

I am aware that willful false statements and the like are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and may jeopardize the validity of the application or any patent issuing thereon.

11.03.2005  
DATE

  
SIGNATURE